

REMARKS

The Office Action mailed February 8, 2008, has been received and reviewed. Claims 1 through 4 and 8 are currently pending in the application. Claims 1 through 4 and 8 stand rejected. Applicant has amended claim 1, and respectfully request reconsideration of the application as amended herein.

35 U.S.C. § 102(b) Anticipation Rejections

Anticipation Rejection Based on U.S. Patent No. 6,319,317 to Takamori

Claims 1 through 3 and 8 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,319,317 to Takamori (“Takamori”). Applicant respectfully traverses this rejection, as hereinafter set forth.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Applicant submits that Takamori does not and cannot anticipate under 35 U.S.C. § 102 the presently claimed invention of independent claim 1, and claims 2-3 and 8 depending therefrom, because Takamori does not describe, either expressly or inherently, the identical inventions in as complete detail as are contained in the claims.

Specifically, Applicant’s invention as presently claimed recites , in part, a “system ... comprising: a platform ... [and] a sensing system ... further configured to continuously directly measure in a dimension substantially orthogonal to the platform a surface level during material deposition of the material on the upper surface according to direct measurements in the dimension substantially orthogonal to the platform until the surface level of the material is directly measured to be the specific thickness.”

Takamori discloses a camera for creating an image in the x and y dimensions. While the Takamori sensor may capture a two-dimensional image (x and y dimensions) from a location above the substrate, the Takamori sensor does not take a *measurement* in a dimension

substantially orthogonal to the substrate as claimed by Applicant. Therefore, Takamori does not describe a sensing system configured to continuously directly *measure in a dimension substantially orthogonal to the platform a surface level during material deposition of the material*. At best, Takamori's capturing of an image above the substrate results in *measurements* in the x and y dimensions and not in a z-dimension. Note: Takamori does not disclose a 3-dimensional camera nor a z-directional analysis of an x and y dimension image. Specifically, Takamori discloses:

- ... detecting sensor 105 for detecting a spreading state of an outline of the outer periphery of the resist solution when the resist solution is discharged onto almost the center of the rotated wafer W and the resist solution spreads out from almost the center of the wafer W toward the outer edge. As this detecting sensor 105, for example, a CCD camera can be used. (Takamori, col. 8, lines 30-36).
- ... the spreading state of the outline of the outer periphery of the resist solution R is detected by the detecting sensor 105 such as a CCD camera or the like (Takamori, col. 9, lines 44-46).

The "sensing system" of Takamori clearly is not "configured to continuously *directly measure in a dimension substantially orthogonal to the platform a surface level during material deposition* of the material on the upper surface according to direct measurements in the dimension substantially orthogonal to the platform" as claimed by Applicant.

Furthermore, because Takamori lacks any description of measuring in a dimension substantially orthogonal to the platform a surface level, Applicant respectfully asserts that Takamori does not describe "directly measur[ing] ... material being deposited ... *until the surface level of the material is directly measured to be a specific thickness.*"

Therefore, since Takamori does not describe, either expressly or inherently, the identical inventions in as complete detail as are contained in the claims, Takamori cannot anticipate under 35 U.S.C. § 102 the presently claimed invention of independent claim 1, and claims 2 and 4 depending therefrom. Accordingly, Applicant respectfully requests the rejections be withdrawn.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on U.S. Patent No. 6,319,317 to Takamori and U.S. Patent No. 6,270,579 to Subramanian et al.

Claims 1 through 3 and 8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Takamori and U.S. Patent No. 6,270,579 to Subramanian et al. (“Subramanian”). Applicant respectfully traverses this rejection, as hereinafter set forth.

To establish a *prima facie* case of obviousness the prior art reference (or references when combined) **must teach or suggest all the claim limitations**. *In re Royka*, 490 F.2d 981, 985 (CCPA 1974); *see also* MPEP § 2143.03. Additionally, the Examiner must determine whether there is “an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1740-1741, 167 L.Ed.2d 705, 75 USLW 4289, 82 U.S.P.Q.2d 1385 (2007). Further, rejections on obviousness grounds “cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *Id* at 1741, quoting *In re Kahn*, 441, F.3d 977, 988 (Fed. Cir. 2006). Finally, to establish a *prima facie* case of obviousness there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986). Furthermore, the reason that would have prompted the combination and the reasonable expectation of success must be found in the prior art, common knowledge, or the nature of the problem itself, and not based on the Applicant’s disclosure. *DyStar Textilfarben GmbH & Co. Deutschland KG v. C. H. Patrick Co.*, 464 F.3d 1356, 1367 (Fed. Cir. 2006); MPEP § 2144. Underlying the obvious determination is the fact that statutorily prohibited hindsight cannot be used. *KSR*, 127 S.Ct. at 1742; *DyStar*, 464 F.3d at 1367.

The 35 U.S.C. § 103(a) obviousness rejections of claims 1 through 3 and 8 are improper because the elements for a *prima facie* case of obviousness are not met. Specifically, the rejection fails to meet the criterion that the prior art reference must teach or suggest all the claims limitations and there is no reason that would have prompted a person of ordinary skill to combine the references as the combination would destroy the reference for its intended purpose.

Regarding the cited references failing to teach all of the claim limitations, Applicant respectfully asserts that neither Takamori nor Subramanian, either individually or in any proper combination, teach or suggest Applicant's invention as presently claimed in amended independent claim 1.

It is very clear that Subramanian teaches *measuring material that has ceased to be deposited* as the material being measured is "developed" (i.e., hardened) in a preceding step 190 of Subramanian's Figure 7. Specifically, Subramanian teaches:

The measurement system 72 then *measures the thickness of the developed photoresist material layer* 50 on the wafer 52 at various locations along the wafer 52 in step 200. In step 210, the processor 64 compares the measured thickness uniformity with the desired thickness uniformity, and determines whether or not the proper thickness uniformity has been achieved within predefined tolerances. If no, the processor 64 enters a routine to reconfigure the path in step 215. In step 220, the processor 64 stores the previous or reconfigured path values to be used for the next wafer. (Subramanian, col. 9, lines 26-36; emphasis added.)

Clearly Subramanian, like Takamori as argued above, also fails to teach or suggest Applicant's claim element of a "sensing system further configured to continuously directly *measure in a dimension substantially orthogonal to the platform a surface level during material deposition of the material*...until the surface level of the material is directly measured to be a specific thickness of the material," as recited in Applicant's amended independent claim 1.

Therefore, since neither Takamori nor Subramanian teach or suggest Applicant's claimed invention including a "sensing system further configured to *continuously directly measure in a dimension substantially orthogonal to the platform a surface level during material deposition of the material* on the upper surface according to direct measurements in the dimension substantially orthogonal to the platform *until the surface level of the material is directly measured to be a specific thickness of the material*", these references, either individually or in any proper combination, cannot render obvious, under 35 U.S.C. §103, Applicant's invention as presently claimed in amended independent claim 1. Accordingly, Applicant respectfully requests the rejection of presently amended independent claim 1 be withdrawn.

Regarding a lack of reason that would have prompted a person of ordinary skill in the art to combine the references, Applicant respectfully asserts that any proposed combination would destroy the cited reference for its intended purpose. Specifically, Takamori teaches of monitoring distribution of resist on a rotating wafer using analysis techniques in the X and Y dimensions. Specifically, Takamori teaches:

- ... detecting a spreading state of an outline of the outer periphery of the resist solution when the resist solution is discharged onto almost the center of the rotated wafer W and the resist solution spreads out from almost the center of the wafer W toward the outer edge. As this detecting sensor 105, for example, a CCD camera can be used. (Takamori, col. 8, lines 30-36).
- ... the spreading state of the outline of the outer periphery [x-y dimension] of the resist solution R is detected by the detecting sensor 105 such as a CCD camera or the like and the detected information [x-y dimension] is input to the unit controller 110. The unit controller 110 calculates the spreading speed of the outline [x-y dimension] of the outer periphery of the resist solution R from the detected information and discriminates whether or not the spreading speed of the outline [x-y dimension] is not more than a predetermined speed (Takamori, col. 9, lines 44-52).

Clearly, the substitution of Subramanian's sensor system that teaches to "*measure[] the thickness of the developed photoresist material layer 50 on the wafer 52*" (Subramanian, col. 9, lines 26-27) in a z-dimension into Takamori with its all-encompassing teaching of calculations in the x and y dimensions, unquestionably destroys Takamori for its intended purpose of "*detecting a spreading state of an outline of the outer periphery of the resist solution*". Therefore, since the alleged combination changes the principle operation of the primary reference and additionally renders the reference inoperable for its intended purpose, the combination is improper. (M.P.E.P. 2143.01). Accordingly, Applicant respectfully requests the rejections be withdrawn.

The nonobviousness of independent claim 1 precludes a rejection of claims 2, 3 and 8 which depend therefrom because a dependent claim is obvious only if the independent claim from which it depends is obvious. *See In re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), *see also* MPEP § 2143.03. Therefore, the Applicant requests that the Examiner withdraw the 35 U.S.C. § 103(a) obviousness rejection to independent claim 1 and claims 2, 3 and 8 which depend therefrom.

Obviousness Rejection Based on U.S. Patent No. 6,319,317 to Takamori OR Takamori and U.S. Patent No. 6,270,579 to Subramanian et al. as applied to claims 1-3 and 8 above, and further in view of U.S. Patent No. 6,642,155 to Whitman et al.

Claim 4 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Takamori OR Takamori and Subramanian as applied to claims 1 through 3, and 8 above, and further in view of U.S. Patent No. 6,642,155 to Whitman et al. (“Whitman”). Applicant respectfully traverses this rejection, as hereinafter set forth.

The nonobviousness of independent claim 1 precludes a rejection of claim 4 which depends therefrom because a dependent claim is obvious only if the independent claim from which it depends is obvious. *See In re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), *see also* MPEP § 2143.03. Therefore, Applicant requests that the Examiner withdraw the 35 U.S.C. § 103(a) obviousness rejection to dependent claim 4 as independent claim 1 is allowable.

ENTRY OF AMENDMENTS

The amendments to claim 1 above should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add any new matter to the application. Further, the amendments do not raise new issues or require a further search.

CONCLUSION

Claims 1-4 and 8 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, the Examiner is respectfully invited to contact Applicant's undersigned attorney.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'K. Johanson', with a long horizontal flourish extending to the right.

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